Amendments to the Specification:

Please replace paragraph [7] with the following amended paragraph:

[7]   Since multiple communications may be sent in the same frequency spectrum and at the same time, a receiver in such a system must distinguish between the multiple communications. One approach to detecting such signals is multiuser detection (MUD). In MUD, signals associated with all the UEs 14, users, are detected simultaneously. Another approach to detecting a multi-code transmission from a single transmitter is single user detection (SUD). In SUD, to recover data from the multi-code transmission at the receiver, the received signal is passed through an equalization stage and despread using the multi-codes. Approaches for implementing MUD and the equalization stage of SUD include using a Cholesky or an approximate Cholesky decomposition. These approaches have a high complexity. The high complexity leads to increased power consumption, which at the UE 14 results in reduced battery life. To reduce the complexity, ~~fast fourier transform~~ Fast Fourier Transform (FFT) based approaches have been developed for MUD and SUD. In some FFT approaches, an approximation is made to facilitate the FFT implementation. This approximation results in a small error being introduced in the estimated data. Accordingly, it is desirable to have alternate approaches to detecting received data.

Please replace paragraph [9] with the following amended paragraph:

[9]   Data is to be estimated from a received plurality of data signals in a code division multiple access communication system. The data signals are transmitted in a shared spectrum at substantially a same time. A combined signal of the transmitted data signals are received over the shared spectrum and sampled. A channel response for the transmitted data signals is estimated. Data of the data signals is estimated using the samples and the estimated channel response. The data estimation uses a ~~fourier transform~~ Fourier Transform based data estimating

approach. An error in the data estimation introduced from a circulant approximation used in the ~~fourier transform~~ <u>Fourier Transform</u> based approach is iteratively reduced.

Please replace paragraph [27] with the following amended paragraph:

[27] Equation 4 acts as the channel equalization stage and Equation 5 as the despreading. A cross channel correlation matrix is defined per Equation 6.

$$R = H^H H + \sigma^2 I \qquad\qquad \text{Equation 6}$$

The linear equation required to be solved is per Equation 7.

$$R \underline{s} = \underline{y} \qquad\qquad \text{Equation 7}$$

$\underline{y}$ is per Equation 8.

$$\underline{y} = H^H \underline{r} \qquad\qquad \text{Equation 8}$$

Although R is not circulant for a multiple of the chip rate sampling, a portion of R is circulant. The circulant portion is derived by eliminating the bottom and top W rows. W is the length of the channel impulse response. By approximating R as a circulant matrix, R_{cir}, R_{cir} is decomposable through ~~fourier transforms~~ <u>Fourier Transforms</u>, such as per Equation 9.

$$R_{cir} = D_D^{-1} \Lambda D_P = \frac{1}{P} D_P^* \Lambda D_P \qquad \text{Equation 9}$$

Please replace paragraph [36] with the following amended paragraph:

[36]   Equation 1 is a general linear equation.

$$Z\underline{x} = y \qquad \text{Equation 1}$$

To determine $\underline{x}$, Equation 20 can be used.

$$\underline{x} = Z^{-1}y \qquad \text{Equation 20}$$

Inverting matrix Z is complex. By approximating Z as a circulant matrix, Z_{cir}, Z is determinable by FFT decomposition per Equations 21 or 22.

$$Z_{cir} = D_P^{-1} \Lambda D_P = \frac{1}{P} D_P^* \Lambda D_P \qquad \text{Equation 21}$$

$$Z_{cir}^{-1} = D_P^{-1} \Lambda D_P = \frac{1}{P} D_P^* \Lambda^{-1} D_P \qquad \text{Equation 22}$$

If Z is a block-circulant matrix, a ~~block-fourier transform~~ <u>Block-Fourier Transform</u> is used instead, which uses equations analogous to Equations 21 and 22.